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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/901,722	07/11/2001	Akihiro Hikichi	03327.2259	7732

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EXAMINER
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TORRES VELAZQUEZ, NORCA LIZ

ART UNIT	PAPER NUMBER
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1771

DATE MAILED: 07/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/901,722

Applicant(s)

HIKICHI ET AL.

Examiner

Norca L. Torres-Velazquez

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 April 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,6 and 7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,6 and 7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments with respect to claims 1-2 and 6-7 have been considered but are moot in view of the new ground(s) of rejection.

a. Applicants have amended the claims to now require "at least 0.1 wt%" of at least one of  $\text{Al}_2\text{O}_3$  and  $\text{ZrO}_2$ . The Examiner provides the reference of Guldberg et al. (US 5,583,080) that provides the inclusion of  $\text{Al}_2\text{O}_3$ . And also applies the RASUCHENFELS (US 4,090,882) reference that provides the composition of the amorphous substance.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-2, 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over ROBERTS et al. (US 4,182,437) in view of GULBERG et al. (US 5,583,080) and further evidenced by JP 56016578 A and CARLSON et al. (US 5,871,159).

ROBERTS et al. discloses a friction material for use in brake lining, clutch pads and the like. The reference teaches that in general, a friction material contains a matrix or binder, such as a thermosetting resin or vulcanized rubber, a fibrous reinforcement, and a friction modifier. (Column 1, lines 25-28) The reference provides an amorphous glass, which in finely divided form, is adapted for use as a combined friction modifier and reinforcing agent for friction material. (Col. 2, lines 49-53) The reference teaches the use of silicate glasses and teaches the

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use of SiO<sub>2</sub> systems with the following compositions in which Fe<sub>2</sub>O<sub>3</sub> may optionally be used as a modifying oxide (refer to Column 4, lines 20-65; claim 11):

SiO<sub>2</sub>: 60% to 75%;  
Li<sub>2</sub>O: 10% to 30%;  
MgO: 8% to 20%;  
Fe<sub>2</sub>O<sub>3</sub>: 0% to 5%

The reference further teaches that the glasses are smelted and fiberized and the fibers maybe either continuous or discontinuous. The diameter and length of the fibers are not at all critical and may vary widely. For example, a diameter may average from about a 0.5 micron to about 30 microns and usually is about 1.75 microns. Lengths, when continuous fibers are not used, may average from about 1 centimeter to about 50 centimeter. (Column 6, lines 64-68 through Column 7, lines 1-3) The reference further teaches that other finely divided forms can be employed such as powder or bead [equated to the presently claimed grains], which, if desired, can be fabricated from the fibers. (Column 7, lines 16-21) The reference teaches the use of an organic resin, elastomers and other additives, modifiers, filler, extenders can be added to the thermosetting organic resin. Further, the reference teaches that the proportions of these are not critical and that in general, the friction material contains in parts by weight from about 20 to about 80 parts of the resin, from about 5 to about 40 parts of the present finely divided glass. (Column 7, lines 16-65)

It is the Examiner's interpretation that ROBERTS et al. provides all the elements claimed in the present application. With regards to the fiber diameter and length, it is noted that the reference teaches that these are not at all critical and may vary widely, as stated above. It is the Examiner's position that the claimed diameters and lengths are known in the art of friction material as evidenced herein. The JP'578 reference is directed to a friction material and teaches

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the use of fibers with diameters of 0.1-30 microns and length of 0.5-30 mm. (Abstract) The CARLSON et al. reference teaches a product to replace asbestos in brake pads and other molded friction materials. (Abstract) The reference teaches fibers with an average length of no more than about 0.15 inch (374  $\mu\text{m}$ ). (Col. 3, lines 16-31) It is noted that the ROBERTS et al. reference discloses that the diameter and length of the fibers are not at all critical and may vary widely.

However, ROBERTS et al. is silent to the inclusion of at least 0.1wt% of one of  $\text{Al}_2\text{O}_3$  and  $\text{ZrO}_2$ .

GULDBERG et al. discloses a fiberizable mineral composition which is thermostable and has a high dissolution rate in biological fluids which consists essentially of  $\text{SiO}_2$  53.5-64 w/w%;  $\text{Al}_2\text{O}_3 \leq 4$  w/w%;  $\text{CaO}$  10-20 w/w%;  $\text{MgO}$  10-20 w/w%;  $\text{FeO}$  6.5-8 w/w%. (Abstract; Col. 2, lines 18-31) The reference teaches that the presence of alumina and ferrous/ferric oxide components in the mineral composition influences the rate of dissolution. (Refer to Col. 3, lines 36-58)

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the glass composition of ROBERTS et al. and provide with a small concentration of alumina with the motivation of providing viscosity to the composition while not significantly affecting the rate of dissolution of the composition as disclosed by GULBERG et al. (Col. 3, lines 11-15 and lines 36-39).

4. Claims 1-2, 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over ROBERTS et al. (US 4,182,437) in view of RAUSCHENFELS (US 4,090,882) and further evidenced by JP 56016578 A and CARLSON et al. (US 5,871,159).

ROBERTS et al. discloses a friction material for use in brake lining, clutch pads and the like. The reference teaches that in general, a friction material contains a matrix or binder, such as a thermosetting resin or vulcanized rubber, a fibrous reinforcement, and a friction modifier. (Column 1, lines 25-28) The reference provides an amorphous glass, which in finely divided form, is adapted for use as a combined friction modifier and reinforcing agent for friction material. (Col. 2, lines 49-53) The reference teaches the use of silicate glasses and teaches the use of  $\text{SiO}_2$  systems with the following compositions in which  $\text{Fe}_2\text{O}_3$  may optionally be used as a modifying oxide (refer to Column 4, lines 20-65; claim 11):

$\text{SiO}_2$ : 60% to 75%;

$\text{Li}_2\text{O}$ : 10% to 30%;

$\text{MgO}$ : 8% to 20%;

$\text{Fe}_2\text{O}_3$ : 0% to 5%

The reference further teaches that the glasses are smelted and fiberized and the fibers maybe either continuous or discontinuous. The diameter and length of the fibers are not at all critical and may vary widely. For example, a diameter may average from about a 0.5 micron to about 30 microns and usually is about 1.75 microns. Lengths, when continuous fibers are not used, may average from about 1 centimeter to about 50 centimeter. (Column 6, lines 64-68 through Column 7, lines 1-3) The reference further teaches that other finely divided forms can be employed such as powder or bead [equated to the presently claimed grains], which, if desired, can be fabricated from the fibers. (Column 7, lines 16-21) The reference teaches the use of an organic resin, elastomers and other additives, modifiers, filler, extenders can be added to the thermosetting organic resin. Further, the reference teaches that the proportions of these are not critical and that in general, the friction material contains in parts by weight from about 20 to

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about 80 parts of the resin, from about 5 to about 40 parts of the present finely divided glass.  
(Column 7, lines 16-65)

It is the Examiner's interpretation that ROBERTS et al. provides all the elements claimed in the present application. With regards to the fiber diameter and length, it is noted that the reference teaches that these are not at all critical and may vary widely, as stated above. It is the Examiner's position that the claimed diameters and lengths are known in the art of friction material as evidenced herein. The JP'578 reference is directed to a friction material and teaches the use of fibers with diameters of 0.1-30 microns and length of 0.5-30 mm. (Abstract) The CARLSON et al. reference teaches a product to replace asbestos in brake pads and other molded friction materials. (Abstract) The reference teaches fibers with an average length of no more than about 0.15 inch (374  $\mu\text{m}$ ). (Col. 3, lines 16-31) It is noted that the ROBERTS et al. reference discloses that the diameter and length of the fibers are not at all critical and may vary widely.

However, ROBERTS et al. is silent to the inclusion of at least 0.1wt% of one of  $\text{Al}_2\text{O}_3$  and  $\text{ZrO}_2$ .

RAUSCHENFELS discloses a glass fibers used as reinforcement that consist essentially of approximately:  $\text{CaO}$  10-60% by weight;  $\text{SiO}_2$  35-70;  $\text{Al}_2\text{O}_3$  1-10;  $\text{ZnO} + \text{ZrO}_2 + \text{Cr}_2\text{O}_3 + \text{TiO}_2$  0.1-10;  $\text{Fe}_2\text{O}_3$  and  $\text{Na}_2\text{O} < 2$ . (Abstract) The reference teaches fibers with length between about 0.05 and 5.0 cm (500 – 50,000  $\mu\text{m}$ ) and a diameter of about 0.005 to 0.05 mm (5-50  $\mu\text{m}$ ). (Col. 3, lines 15-19)

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the glass composition of ROBERTS et al. and provide it with a

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composition that includes alumina motivated by the desire of producing a glass fiber that is strong as disclosed by RAUSCHENFELS (Col. 1, lines 38-40)

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

YALE (US 4,014,705)

MATTSON et al. (US 2003/0004049 A1)

RAPP et al. (US 5,968,648)

SASAHARA et al. (US 6,284,815 B1)

TENEYCK et al. (US 5,585,312)

SONG (US 5,428,081)

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

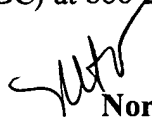


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7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Norca L. Torres-Velazquez whose telephone number is 571-272-1484. The examiner can normally be reached on Monday-Thursday 8:00-5:00 pm and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on 571-272-1478. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Norca L. Torres-Velazquez  
Primary Examiner  
Art Unit 1771

June 29, 2005